




**CUBRO**  
NETWORK VISIBILITY

# SMARTNIC (NPU) - OMNIC



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## DATA SHEET

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Please refer to the latest version of this document on our website  
to ensure you have the most up-to-date information.

## Product Highlights

- User plane Monitoring for Mobile and Fixed networks
- Deep Packet Inspection (DPI) Metadata
- Session-aware Flow slicing
- DNS Analyzer and KPIs
- TCP Delay Measurement KPIs

## Product Overview



4 x 10/ 25 Gbit/s Interface



2 x 100 Gbit/s Interface

Omnic, the latest offering from Cubro, is a state-of-the-art SmartNIC that brings a new level of efficiency and scalability to network operations. This innovative device combines advanced Network Processor (NPU) technology with a powerful ARM CPU to exceed expectations and meet the ever-increasing demands of modern networking environments.

Tailored to cater to diverse network requirements, Omnic comes in two variants: the 4 x 10 or 25 Gbps variant and the 2 x 100 Gbps variant. Its unparalleled scalability allows for seamless integration from single-card setups in small servers to as many as 8 cards in a 4 U server, achieving exceptional performance of up to 500 Gbps per 4 U without compromising the server's resources.

More than just a SmartNIC, Omnic functions as a comprehensive network processing unit, equipped with a cutting-edge 24-core ARM CPU. This unique design enables applications to run directly on the card, streamlining network operations and offloading server applications.

While Cubro provides Omnic hardware, it also provides Linux kernel operating systems and development kits. The customer's various DPDK applications, VPP applications and ordinary Linux driver applications originally running on the x86 server can be quickly transplanted to the Omnic with a simple compilation.

This combination of VPP, DPDK and Linux technologies provides a powerful platform for easy and rapid expansions on new or emerging business applications and hence allows cloud data center administrators to build up their highly-efficient, highly-intelligent and highly-flexible networks operations while at the same time, minimize computing resource consumption in their data center servers and optimize their overall cost of operations.

## Key Product Features

- 4 Ports of 25Gbps SFP28 or 2 Ports of 100Gbps QSFP28 Interfaces: With up to 100Gbps processing of network functional services
- High-performance DPU chip, up to 24-core high-performance ARM processor, integrated various hardware acceleration coprocessors (such as hardware encryption and decryption coprocessors, compression and decompression coprocessors, etc.)
- Host Software Supports: DPDK & VPP driver
- SNIC Firmware Supports: Standard Linux kernel & container environment, DPDK and VPP driver
- Large Capacity ACL & Connection Tables: Support over 10 Million concurrent sessions with 64GB internal memory
- Dedicated OOB Port - For independent network management functions
- Cost Efficient: ~1/3 of the cost of comparative-performance FPGA-based NICs
- Rapid CI/CD Supports: With online NIC firmware upgrade through the PCIe interface
- Generate customized KPIs based on network delay and DNS statistics.









## Product Specifications

Category		OMNIC-425-MAU	OMNIC-2100-MAU
Interface	Network Interface	4*25GE SFP28	2*100GE QSFP28
	Host Interface	PCIe*8 Gen3.0/Gen4.0	
	Management Interface	1*Console Micro USB, 1*GE RJ45 OOB Port	

Power & Dimension	Power Consumption	60W	
	Dimension (W*H*D,mm)	111.15mm*21.8mm*167.65mm	111.15mm*21.8mm*184.16mm
	Weight (kg)	0.8	
	Operating Temperature	0~35℃	
	Operating Humidity	10%~90%(non-condensing)	
Core CPU	Architecture	DPU	
	Part Number	CN96XX	
	Number of Processor Cores	24	
	Core Clock Frequency	1.8GHz	
	Number of CPU Part	1	
	Cache Capacity (MB)	L2 5MB, L3 14MB	
Memory & Storage	Memory Capacity	32GB DDR4, maximum 64GB	
	Memory Type	DDR4 ECC SODIMM	
	Memory Capacity Expansion	64GB	
	Flash Storage (GB)	64GB EMMC 5.1	

## Application Scenarios

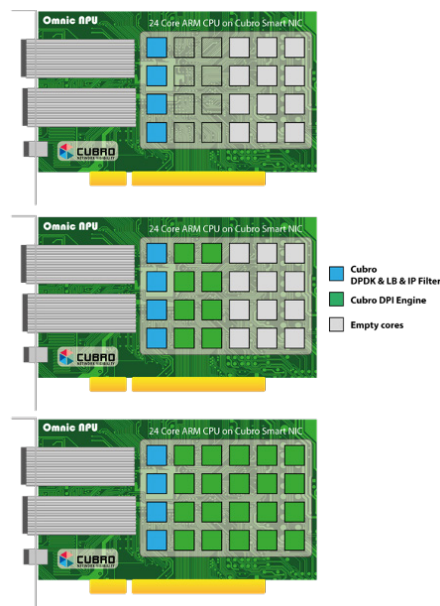
- For Cloud Data Center Applications
  - OVS Offload
  - OVS Offload + 3rd-Party Applications
  - VxLAN (VTEP) Offload
  - ECN/QCN/DCTCP/NVMeoF(TCP) Offload
  - Virtual NPB for VM/Container
  - Virtual Inband Network Telemetry
- For MEC & Gateway Applications
  - 5G UPF Offload
  - eBPF Offload
  - SSL Offload
  - Gateway NFV(vLB/vFW/vR) Offload
  - User-Defined ACL Rules for Enhanced Network Security

Network Services	Storage Services	Computer Services
Packet Processing  SDN/NFV  	NVMe  Raid/EC  De-Dupe  Key Value Pair   <b>redis</b>   <b>ceph</b>	     <b>docker.</b>   <b>vmware</b> ESXi

Cubro provides a complete development kits support, customers can flexibly combine functions according to the actual functional requirements of their own networks to meet the deployment needs in different environments, just like people install various APPs on their mobile phones according to their own preferences.

## Cubro DPDK software stack

Cubro offers a DPDK-based software stack that utilizes 24 ARM cores on the CPU for optimal performance. It includes load-balancing capabilities for packet reception and distribution, filtering functionality, and the ability to leverage additional cores for tasks such as DPI metadata extraction. The software stack also supports integration with third-party applications like Zeek and Suricata, although this may require additional development efforts as they are not plug-and-play solutions.



## User/Client Delay Measurement

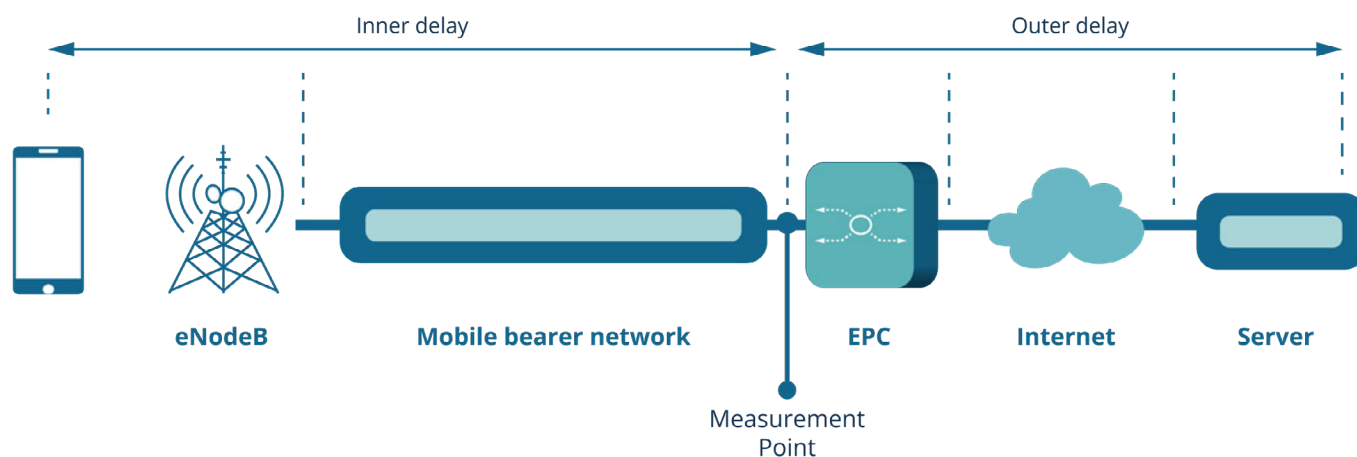
### Key Concept:

- Create metadata that measures network latency response time
- Per user per defined time frame a record is generated

This information can be correlated to the Control plane information for mobile networks

### Advantages:

- Customer experience does not only rely on traffic throughput, short response times (delay) is important
- As the metadata can be enriched with control plane information many KPIs can be generated

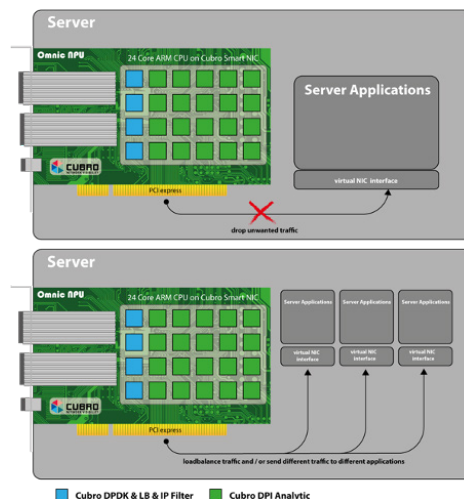


## L7 Application Filtering on Omnic

In this version the DPI engine provides metadata to perform application filtering. (YouTube, Netflix, etc.)

The connection to the software is established through a virtual NIC interface, allowing the Omnic to remain fully transparent to the application.

The user benefits from capabilities such as dropping unwanted traffic, load-balancing traffic and sending traffic to different applications.

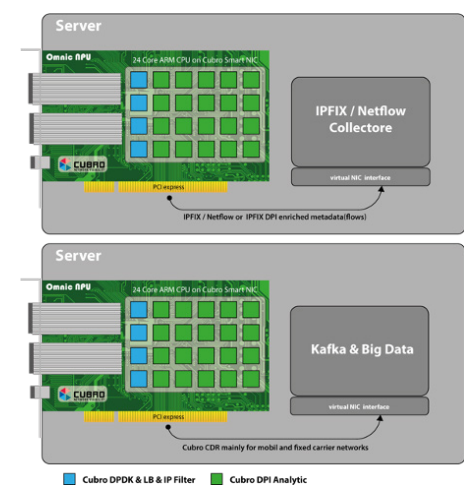


## DPI on Omnic

The Omnic provides DPI enriched metadata. This information is forwarded via a virtual NIC interface to any application running on this server, virtual or non-virtual.

This offloads the server by generating the flows and provides higher performance to the application.

There are two options, internal over the PCI Bus or external over the standard NIC



## Ordering Information

HARDWARE	
CUB.OMNIC-425	Omnic425 NIC 4x25G
CUB.OMNIC-2100	Omnic2100 NIC 2x100G
SOFTWARE	
CUB.OMNIC-SW-MAU	Omnic Mobile application User plane metadata generation option
CUB.OMNIC-SW-MAC	Omnic Mobile application Control plane metadata generation option
CUB.OMNIC-SW-DNS	Omnic DNS metadata generation option
CUB.OMNIC-SW-CU	Omnic Custos metadata generation option
CUB.OMNIC-SW-SEC	Omnic Flow Slicing option
CUB.OMNIC-SW-MA	Omnic Measurement metadata generation option
CUB.SUPPORT-OMNIC	Omnic Support fee per year